

[0044] When the detected bend is an index display command (step S202: YES), the display controller 103 controls to display the index on a portion of the display unit 110 (step S205).

[0045] The detecting unit 101 then determines whether an index is specified from among the indexes displayed (step S206), and if not, waits in standby until one of the indexes is specified (step S206: NO). When a command is made for an index (step S206: YES), the display controller 103 controls to display a display content corresponding the specified index is displayed (step S207). Thus, one series of processing ends.

[0046] The display unit 110 displays the display content according to a display control by the display controller 103. According to the display content of the display unit 110, the operator operates the display by bending the display unit 110. The bend of the display unit 110 is again detected by the detecting unit 101 of the display control apparatus 100, and the display control process described above is performed.

[0047] As described above, according to the display control apparatus 100 of this embodiment, a desired page can be speedily displayed by an operation similar to that for an actual book.

[0048] A display control apparatus according to another embodiment of the present invention is incorporated in a flexible display including, for example, a flex sensor, thereby realizing an electronic book that can easily be carried by an operator.

[0049] FIG. 3A is a schematic of an electronic book according to this embodiment. An electronic book 300 includes a display unit 301, a left top edge detecting unit 302, a left center edge detecting unit 303, a left bottom edge detecting unit 304, a right top edge detecting unit 305, a right center edge detecting unit 306, a right bottom edge detecting unit 307, a display control apparatus incorporated in the display unit 301, and an electronic book data obtaining unit (these last two are not shown).

[0050] The electronic book 300 includes a flexible display. The display unit 301 displays the content of book data obtained by the electronic book data obtaining unit based on display control performed by the display control apparatus. The left top edge detecting unit 302, the left center edge detecting unit 303, the left bottom edge detecting unit 304, the right top edge detecting unit 305, the right center edge detecting unit 306, and the right bottom edge detecting unit 307 include flex sensors, the outputs from the flex sensors of these detecting units 302 to 307 being input to the display control apparatus. The left top edge detecting unit 302, the left center edge detecting unit 303, the left bottom edge detecting unit 304, the right top edge detecting unit 305, the right center edge detecting unit 306, and the right bottom edge detecting unit 307 form parts of the display unit 301, and display contents corresponding to display controls performed by the display control apparatus. The flex sensors of the detecting units 302 to 307 form detecting units.

[0051] The detecting units 302 to 307 include flex sensors that use detecting units to detect the bend level when the operator bends the flexible display. However, since flexible displays are generally thin, the flexible displays are likely to be bent even when the operator does not intend to bend. The flexible display is also bent naturally when picked up,

leading to a possibility of executing an operation that is not intended by the operator. Therefore, it is preferable that the detecting units 302 to 307 include a touch panel using a capacitance system or the like in addition to the flex sensors on the surface of the display unit 301, and the outputs of the flex sensors are made valid using a determination of whether the operator is touching it as a trigger. This configuration can prevent erroneous operation due to a natural bent or unintended bent caused by a wind or by contacting other objects.

[0052] A conventional flex sensor of flexible film is briefly explained (for details, see JP-A No. 2001-518185). A flex sensor detects the bend level of a flexible film (in this embodiment, a flexible display) that the flex sensor itself is attached to. The flex sensor is measured around one or two axes at a right-angle to the long directional dimension of the substrate, according to the properties of that substrate. For example, when using a rope-shaped substrate, a bend has to be sensed directly or indirectly around two axes. The number of sensors required can be reduced by providing a substrate that deforms only within a limited flexibility.

[0053] For example, among flex sensors based on optical fiber technology, looped end-type fibers are particularly suitable for sampling the amount of warping at plural positions when the relevant fiber ends are all connected to a plurality of optical fiber source-type photosensor/signal processing units. To measure the bend of a flexible film, the sensitive part of a processed optical fiber can be approximately aligned so as to cut across an axis generated around the bend, such as an axis that expands in a direction intersecting the entire length of a ribbon structure.

[0054] Capacitance is also a conventional technique, and is briefly explained. The capacitance system is a position-detecting system in which a glass face of a transparent conductive substrate is coated with a substance for receiving electrical signals, and a sensor is used to detect an electrical signal when a finger of an operator approaches the glass face. In comparison with other systems used in touch panel position detection (for example, infrared light-interception systems and ultrasonic wave/surface elastic wave systems), a capacitance system has an advantage of enabling a highly durable panel to be made easily. Other position-detecting systems include resistance film systems and electromagnetic induction systems. Since their benefits vary according to cost, transmissivity of the panel, and so on, a system can be selected considering how the electronic book is to be used.

[0055] The display control apparatus controls the display of book data obtained by the electronic book data obtaining unit based on the output from the flex sensors of the display unit 301.

[0056] Explained in further detail, the display control apparatus includes a detecting unit, a determining unit, a display controller, and a display content retaining unit. A basic operation of the apparatus includes use of the detecting unit to detect the bend level of the display unit 301 of the electronic book 300. Based on this detection result, the determining unit determines a display command from the operator. The display content is input to the display controller, and the desired display content is displayed by controlling the display unit 301. When storing a predetermined display content and when adding a predetermined display content to the index after marking it, the display content is stored in the display content retaining unit.